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AUTHOR Emmer, Edmund T.
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ABSTRACT

Reporting on part of the data collected in the Junior High Classroom Organization Study, this document focuses on the mathematics subsample. Twenty-six mathematics teachers in 11 junior high schools were observed in two classes. The major purpose of this paper is to describe the classroom procedures and behaviors of teachers identified as effective classroom managers. First, the correlations of management variables and the achievement and attitude variables are considered. Next the extent to which teachers affect the classes' achievement gains is reviewed, followed by a description of the process of selecting subsamples for further analysis and description. A model of appropriate and inappropriate teacher management methods is outlined, and further illustrated by two case studies excerpted from narrative scripts that describe a poor manager and a highly capable one. The study indicates that effective classroom management throughout the year is facilitated by several facets. Among these, the good manager made a clear set of expectations for appropriate student behavior in a wide variety of class activities, and were characterized by good monitoring and prompt handling of inappropriate behavior. (MP)

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Effective Management in Junior High Mathematics Classrooms

Edmund T. Emmer

Research and Development Center
for Teacher Education
The University of Texas at Austin

(R&D Rep. No. 6111)

Research and Development Center for Teacher Education
The University of Texas at Austin

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Effective Management in Junior High Mathematics Classrooms

In numerous process-product studies, variables indicative of the teacher's ability to manage the classroom have been consistently identified as predictors of student outcomes (Evertson, Anderson, Anderson, and Brophy, 1980; Medley, 1977). This result has also been observed specifically in junior high school mathematics (Evertson, Emmer, & Brophy, 1980). A plausible link between management capability and student achievement is through the increased amount of on-task student behavior and learning time resulting from better management practices. In fact, if student engagement (or student attention, involvement) is considered a major indicator of management effectiveness, then a substantial literature supports its relevance to pupil achievement through moderate to low positive correlations (Bloom, 1976; Jackson, 1968; Rosenshine and Berliner, 1978; Fisher, Filby, Marliave, Cahen, Dishaw, Moore, and Berliner, Note 1).

Effective management practices in short instructional segments (e.g., single lessons) have been studied intensively by Kounin and others (Arlin, 1980; Kounin, 1970; Kounin & Doyle, 1975; Kounin & Gump, 1974). Other studies have identified the beginning of the year as an important time (Moskowitz & Hayman, 1975; Tikunoff, Ward, & Dasho, Note 2). The first weeks of school are especially critical for rule-setting, establishing procedures, demonstrating consistency, and eliciting student engagement in work at both the elementary (Emmer, Evertson, & Anderson, 1980) and at the junior high school levels (Emmer & Evertson, Note 3). In the latter two studies, numerous teacher activities and behaviors associated with better management at the beginning

of the year were identified and described. In the present paper, the management behaviors of mathematics teachers in subsamples of the previously noted study will be re-examined. This paper will therefore, extend the scope of the beginning-of-year study to the characteristics of effective management throughout the year.

OVERVIEW OF THE STUDY AND SUMMARY OF MANAGEMENT RESULTS

The data reported in this paper were collected as part of the Junior High Classroom Organization Study. In that study, extensive observations were made of both mathematics and English teachers throughout the school year. Because this paper is concerned only with the math subsample, the description of methodology will be restricted accordingly. Furthermore, only a limited description of observation procedures, training, and instrumentation are presented. A more extensive presentation can be found in Evertson, Emmer, and Clements (Note 4).

In addition, in order to provide a context for interpreting the management results, some data on student achievement and attitudes will be presented. Because these data are ancillary to the major purpose of the paper, that of describing effective management practices, the achievement and attitude data will be described only briefly.

A total of 26 mathematics teachers (Grades 7 and 8) in 11 junior high schools were each observed in two classes. During the first 3 weeks of the year approximately 11 observations, divided between the two classes, were made of each teacher, with one class allocated somewhat more observation time. During the remainder of the year through April, each teacher was observed once every 3 or 4 weeks in each of the two classes.

Assessment of Classroom Processes

Observation procedures were varied to allow the collection of several types of process data. Student Engagement Rates (SERs) were assessed every 15 minutes by having the observer count the number of students who were in one of several modes: on task in academic or procedural activities, off task in sanctioned or unsanctioned activities, or in "dead" time (waiting). Activities were also classified by format (e.g., recitation, checking, seatwork, etc.). SERs were scored by converting frequencies to proportions (based on total number of students present), and averaged for each period of observation. The SER observation form is shown in Figure 1.

After each observation, the observer recorded judgments about teacher and student behavior and characteristics using the Component Ratings (CRs), a series of 5-point scales. The variables were chosen eclectically, from a task analysis of management functions, a consideration of previous management research, hunches, and methodological interest. The Component Rating form is shown in Figure 2. Definitions and procedures for using the scales are given in Evertson, Emmer, and Clements (Note 4).

Observers took extensive notes during each visit and used these notes to dictate Narrative Records. These were typed and form the basis for case study information on each teacher and class. Observers were trained to provide narratives which preserved the chronology of events and activities, while giving details of observed behavior, instruction, organization, and management. Narratives were subsequently read and summarized by project staff. Observers also constructed Time Logs, preserving a record of the duration of various activities and their

sequence.

Observer reliability was assessed by using data from 24 occasions when pairs of observers visited classrooms. Most of the SER and CR variables showed adequate agreement. A few which did not were retained for analysis because the unreliability seemed to be a function of low variance during the reliability observations, and because in subsequent stability analyses these variables exhibited significant reliability. Reliability (agreement) coefficients are presented in Tables 1 and 2. These coefficients are based on single observations. When averages across multiple observations are used to estimate variables, the reliability of the average scores is higher. Consequently, although observer agreement coefficients for some items are not high, they are adequate considering that multiple observations were used to derive variable scores.

Student Achievement and Attitudes

Student achievement was assessed using a 78-item multiple choice test based on the textbook series adopted by the district for use in all seventh- and eighth-grade classes. Internal consistency reliability of the test was .94. Student learning, or achievement gain, during the year was estimated using class mean residual achievement. This was calculated via regression analysis. Scores from CAT math tests administered the preceding spring in district-wide testing were used in the regression equation as the measure of entering achievement. The differences between the class mean achievement and the predicted achievement, based upon entering levels, is the measure of residual achievement, or achievement gain.

Student attitudes were assessed using 15 items from the Student

Ratings of Teachers (SRT), an adaptation of the Student Rating Scale of Instructors (Stallings, Needels, & Stayrook, Note 5). SRT items reflect student opinions regarding quality of instruction (e.g., clear directions and assignments, encouragement to think independently, a fair grading policy, good control), relationship with the teacher (e.g., listening, approachability), and evaluation of the teacher and course (e.g., amount of learning, enjoyment of class). Although we had hoped to obtain scores for several types of student perceptions, the reliability and factor analyses indicated that the students' perceptions were basically unidimensional. Therefore, the responses to the SRT items were summed and used as a single variable. The internal consistency reliabililty of the SRT was .89. It should be noted that students' perception as indicated by the SRT was generally positive in most classes. The sample mean was approximately 61, indicating an average response of a little more than 4 on each item. The response of "4" was keyed to "usually" indicating a generally favorable impression of the teacher/instruction with respect to the characteristic.

Project staff, usually observers, administered the SRTs in late April, and the achievement tests, in early May.

Preliminary Treatment of the Data: Intercorrelations, Reliability, Stability

The major purpose of this paper is to describe the classroom procedures and behaviors of teachers identified as effective classroom managers. Before addressing this concern however, several related issues will be considered, because they will provide a more complete picture of the management function. First, we will examine the correlations of the management variables and the achievement and attitude vari-

ables. Next, we will consider the extent to which teachers affect their classes' achievement gains. Finally, we will describe the process of selecting subsamples for further analysis and description.

Table 3 shows the intercorrelations of several management criteria and the entering achievement (CAT), end-of-year achievement (ACH), residual achievement (ACH-RES), and student attitudes (SRT). The data are from the 52 observed math classes. The correlations between the management criteria and class mean residual achievement are in the predicted direction and are statistically significant, although their magnitude is not great. Nonetheless, they are in the same range as has been found in other studies of such variables. Management criteria and SRT means are generally not significantly related. The management criteria themselves are generally highly interrelated. There is a low positive correlation between residual achievement and SRT means.

Of interest is the correlation of .96 between CAT and ACH. This means that approximately 92% of the variance in ACH is attributable to entering class achievement levels. Using class means as the unit of analysis greatly reduces measurement error variance; however, even assuming that there is minimal error, the variance not explained by entering achievement is no more than 8%. This does <u>not</u> mean that teachers have little effect on pupil achievement; the comparison is among teachers, rather than to no teaching at all; thus, this result should not be interpreted to mean that an individual teacher's effects are minimal. The low estimate of teacher effect probably results, in part, from difficulty in preparing an achievement test, suitable for administration in a single period, to assess learning during an academic year's time in a very diverse population of students. Testing was

limited to a single period, so fewer than one item per 2 days of instruction was used, and we could not take into account the special emphases and objectives which teachers may have adopted to meet their students' needs. Therefore, the estimate of learning differences among classes is probably an underestimate, and correlations between this product measure and other variables such as the management criteria are probably attentuated. Additional discussion of the amount of learning attributable to teachers can be found in Gage (1978).

Stability Analyses

Because each teacher was observed in two classes, it is possible to determine how much similarity in effect exists between classes. Table 4 shows the stabilities of several management criteria and of achievement and student attitudes. In the table, the statistic (rho) is the intraclass correlation, which is the reliability of the class mean of each variable; i.e., the proportion of variance attributable to the Teacher effect (rather than error, Context, or Teacher X Class effect), for each variable. Management criteria (averages for each period from October through April) are fairly stable from period to period, within teachers. About half the variance in class mean residual achievement is attributable to teachers; about two-thirds of the variance in student attitudes is attributable to Teachers. Note that entering achievement levels (CAT 78) are not stable. That is, no tendency is apparent in the data for some teachers to have classes with only very high or very low initial achievement levels. This indicates that the teacher effects are not the result of some teachers having initially more (or less) knowledgeable students.

Selection of More and Less Effective Managers

The goal of the subsample selection process was to identify two sets of teachers whose management effectiveness varied considerably, thus allowing a contrast to be made between their teaching activities. Accordingly, the 26 teachers were ranked on five management criteria variables, using data from the October through April period in both observed classes. The variables used were off-task behavior proportions, academic on-task behavior, disruptive behavior, inappropriate behavior, and a management factor derived from 18 items of an end-of-year observer assessment. The sum of the ranks was then computed and used as a composite index of management effectiveness.[1] Teachers were grouped according to their classes' entering CAT means and contrasting sets of more and less effective managers were chosen. This resulted in seven more effective managers and seven less effective managers being identified. One additional teacher was identified who appeared to have good management results, but who had well below average SRT and residual achievement outcomes. Rather than consider this teacher as "effective," we separated this teacher's data from the seven more effective managers. Data from this teacher's class will be described later in the paper in the section on subgroup results.

Results

Characteristics of the Subsamples

Means and standard deviations of the subsamples of teachers on several management criteria, and on the achievement and attitude data

[1] An earlier report (Emmer & Evertson, Note 3) used residual achievement and SRT means as additional criteria for subsample selection. The current procedure resulted in the replacement of one teacher from each of the two subsamples and the addition of two other teachers. Five teachers in each group were the same in both analyses.

are shown in Table 5. The two groups are of course, clearly differentiated on the management criteria. However, in keeping with the correlational data previously presented, the product data do not show the marked discrimination evident on the management variables. The two subgroups are significantly different on residual achievement ($p < .05$, one tail t test), and not different on their SRT means.

Within the more effective manager group, several subgroups are notable. Two teachers have both high achievement residuals and high SRT means. Two teachers have high SRT means and achievement in the average range. Three teachers have scores in the average range on both variables.

Within the less effective managers' group, one teacher has low achievement residuals and high SRT means; two teachers have low achievement and average SRT means; one teacher has low SRT and average achievement; two teachers have average achievement and average SRTs; and one teacher has average achievement and above average SRTs.

Thus, in the group of more effective managers, four of the teachers have a positive effect on either achievement or attitudes, or both; no teacher has a net negative impact. Of the less effective managers, four have a negative effect on either attitudes or achievement. It should be borne in mind, however, that the teacher excluded from the more effective group had negative effects on <u>both</u> achievement and attitudes.

To this point in the analyses, we have identified groups of more and less effective managers. We have also noted that within the groups, differences are apparent on achievement and attitude variables In the remainder of the paper, we will focus on two results. First, the two groups of more and less effective managers will be compared in order to

identify major dimensions of classroom management. Second, we will look at differences in management and instruction within groups, to determine whether any patterns of behavior can be identified to clarify the achievement and attitude results.

Comparison of More and Less Effective Managers

In addition to the data presented in Table 5, the two groups of teachers were compared on the Component Ratings and Time Use Variables (derived from the Time Logs). Results of these t test comparisons are presented in Tables 6 and 7. These data are from the October through April observations.

Major differences between the two groups are revealed by the Component Ratings.

Behavior Management

Compared to the less effective managers, the more effective managers emphasized preventive measures for handling inappropriate behavior. The more effective managers were more careful monitors (CR 10,), were less likely to ignore inappropriate behavior (CR 42), and they were more likely to stop disruptive or inappropriate behaviors quickly when they occurred (CR 24, CR 38). The two groups did not differ significantly in their methods for treating misconduct, except for the use of individual conferences (CR 29, CR 43). Less effective managers used this technique more often, although infrequently; their average use was about once per period. The use of some kind of desist signal was the most typical reaction in both groups.

In addition to their stronger preventive skills, the more effective managers were also seen as more proactive in eliciting desired behavior. They were more likely to use signals for appropriate behavior (CR 19),

and they were clearer about desired attitudes and behavior (CR 14). More effective managers also were more consistent in managing behavior (CR 21) and used more positive reinforcement. No differences were observed in the use of punishment.

Instructional Skills

The data show that the more effective teachers were better at communicating clearly (CR 1, CR 8, CR 11), and were more able to design instruction and to accommodate students' abilities (CR 2, CR 3, CR 6, CR 7, CR 12, CR 15, CR 17). Their classes were rated as more task oriented (CR 35).

Receptivity to Students

The more effective managers were rated higher on several related variables such as the use of listening skills (CR 30), orientation to student needs (CR 33), and receptivity to student input (CR 32). No differences were obtained on variables which reflect a more active approach to attitude change or development (CR 31, CR 34, CR 36).

Time Use

No differences between the more effective and less effective managers' use of time were found (Table 7). Considerable variation within groups in the amount of time spent in various categories was noted and is described later in this paper. A common sequence for time use was characteristic of most classes. The sequence consisted of a beginning-of-class routine, followed by checking, then content development, and lastly seatwork.

Discussion of Results for More Effective and Less Effective Manager Groups

The statistical analyses of the Component Ratings identified

numerous differences between more and less effective managers during the year. The interpretation of these differences and a description of characteristics of effective management should be done from the perspective of the beginning of the year. Our previous work in third-grade classrooms (Emmer, Evertson, & Anderson, 1980) and in the present study's sample at the beginning of the year (Emmer & Evertson, Note 3) indicates that effective managers begin the year with specific expectations about appropriate student behavior and that they translate these expectations into a comprehensive set of rules and procedures. The rules include provisions governing general conduct; e.g., hand raising, movement about the room, peer interaction, gum, tardiness, etc. Procedures usually prescribe particular behaviors at set times or in certain activities. Efficient procedures accomplish several things: They maintain student responsibility for work involvement and completion, they allow transitions to be made smoothly, and they allow class activities to be carried out efficiently. For example, students can be taught a routine for exchanging homework papers for correction. After learning the routine, students in a well managed class can execute it whenever the teacher provides the appropriate signal. Another example is how to get help when the teacher is already occupied. Several different procedures can be devised to manage this problem successfully; however, an inadequate or missing procedure will result in higher off-task behavior during seatwork activities.

In addition to having a set of rules and procedures which establish clear expectations for students, effective managers were highly consistent in their use and enforcement of these rules and procedures at the beginning of the year. Furthermore, they monitored student behavior

carefully and were prompt in handling inappropriate behavior when it occurred.

Disruptive behaviors, and off-task behavior in general, almost never occurred during the first week of school in either the more effective managers' classes or the less effective managers' classes. However, during the second and third weeks, significantly higher amounts of these behaviors began to occur in the less effective managers' classes, but not in the more effective managers' classes. During the remainder of the year, even higher levels of these inappropriate behaviors occurred in the less effective managers' classes, while the more effective managers maintained their classes' low rates. Thus, it appears that the establishment of effective management at the beginning of the year is facilitated by a coherent system of rules and procedures addressing major classroom tasks required of students in various activities; and by teaching the system to the students through consistent use of rules and procedures, careful monitoring and prompt attention to failure to follow rules and procedures. Conversely, conditions which generate high levels of off-task behavior, task avoidance, and disruption -- i.e., poor management -- will occur when teachers do not plan and implement rules and procedures which are needed to carry out common classroom tasks, when they do not consistently use the system they have put into place, and when they do not monitor student behavior or deal with deviations from the rules and procedures.

The Remainder of the Year

The pattern of teacher behavior described in the preceding paragraphs that initially discriminated between the more effective and less effective teachers at the beginning of the year, also discriminated

between the teacher groups during the remainder of the year. An examination of the narratives by readers unfamiliar with the group classifications of the teachers, as well as the statistical comparisons presented earlier, showed numerous differences. We will consider the more important of these now.

Effective managers typically had procedures for guiding their own and their students' behavior during a wide range of classroom activities. Major areas for procedures included beginning the period, conducting instructional activities and ending the period. At the beginning of the year, expectations or procedures had been established for major concerns such as student talk, having books and materials ready for use during the period, and student behavior while the teacher carried out necessary administrative procedures, such as attendance reporting. For instructional activities, procedures were usually developed to manage how students might contact the teacher, student movement about the room, leaving the room, student talk during whole class and during seatwork activities, and appropriate student behavior when seatwork was completed.

A common beginning-of-period activity was the "warm-up," a set of five or six review exercises which were displayed on the overhead projector or chalkboard. Students worked on these problems during the first few minutes of each period, allowing the teacher the opportunity to check roll, turn in an absence report, handle tardy students, sign attendance permits, or perform other tasks. The activity also facilitated the transition from the beginning of the period to the first whole class activity with maximum on-task behavior, with minimal or no chance of disruption, and, if the problems were carefully chosen, with high

success for most students.

During instructional activities, a number of procedures were initiated to maintain student involvement in work. Work requirements, such as policies regarding neatness, format, and completion were established. Teachers commonly had a procedure for communicating assignments. Some system was also in place for helping previously absent students to identify make-up work and to receive assistance.

Other routines that were used to achieve good management results included procedures for checking assignments, for distributing or collecting materials, and for ending the period. In many of these cases, we observed the teacher structuring the transition (Arlin, 1980) between two activities, by teaching the students to follow a procedure. Once the procedure became a routine, then problems with disruption during the transition were minimized. The effect of structures (or routines or learned procedures) is evident not just in transitions between activities, but in the activities themselves. When students know what behavior is expected, they are more likely to perform it. When students are not sure what they are supposed to do or how to do it, they will, at best, take longer to perform the activity, and more likely than not, some students will behave inappropriately in the process.

Poorer managers were more likely to have rules and procedures which addressed only a subset of the major areas requiring procedures. Their procedures were also less systematic; that is, they did not specify as carefully or completely the steps to follow to accomplish the task. The looser structure associated with their activities gave rise to higher levels of off-task behavior.

Monitoring and Handling Inappropriate Behavior

Throughout the year, more effective managers were characterized by good monitoring and prompt handling of inappropriate behavior. After the first month of classes, a pattern of appropriate behavior was established in the more effective teachers' classes, so that the monitoring function could be carried out more easily. Also, in these classes, the teacher's rules and procedures had clearly established behavioral expectations, which also facilitated the act of monitoring. In the less effectively managed classes, incomplete specification of appropriate behavior probably caused the teacher to attend selectively to some inappropriate student behaviors, but not to others. For example, all the less effective teachers had some rule or procedure for tardiness and would indicate awareness of a tardy student. In this case, the inappropriate behavior is obvious, the teacher has a clear expectation about what is appropriate, and can act on that belief. Many other behaviors are less obvious. For example, suppose the teacher establishes no procedure regarding the materials necessary to begin the period (e.g., pencil, text, and notebook). Not only are the students less likely to bring each component of their materials, but the teacher probably is less likely to notice it until the material is required for some activity. In other words, a procedure which the teacher presents to or teaches students helps focus the teacher's attention because the teacher associates the procedure with a time or activity. The time or activity then acts as a cue or signal for the teacher to monitor that student behavior.

Throughout the year, the management of inappropriate behavior by teachers in the two groups was similar, except that the more effective teachers were less likely to ignore it and more likely to stop it

promptly. It is apparent that the less effective teachers, after the first several classes had passed, were at a considerable disadvantage. Higher levels of inappropriate behavior were beginning to occur in their classes, so that monitoring and prompt handling would increase the number of interruptions of lessons and therefore slow down their pace, inviting further off-task behavior. However, when the teachers chose to ignore the inappropriate behavior, then they demonstrated inconsistency between the stated rules and procedures and their actual use. Caught in this dilemma, less effective teachers tended toward the "ignore and push on" alternative. Another possibility would have been to revise rules and procedures to be more workable, but we rarely observed their systematic modification during the year.

What did the more effective teachers do when inappropriate behavior occurred? We have noted that they were more likely to see it, because they kept their eyes on the students and because they monitored at critical times (e.g., at the beginning of seatwork). A low-key, matter-of-fact response was the norm, usually by making eye contact or a brief comment. Typically, because the procedures had been clearly presented and consistently used, the brief teacher intervention was a sufficient signal for the student to begin appropriate behavior. Continuation of inappropriate behavior was also discouraged by the history of high on-task behavior in these teachers' classes, which probably helped establish a norm for task involvement rather than avoidance.

The more effective and less effective managers' means for several instructional characteristics were also significantly different, and favored the more effective managers. Our interpretation of these results is that they reflect three different effects. First, the two

groups probably were different in their ability to present information and organize instruction. However, it is also probable that the better management in the more effective classes caused the teachers to be able to exhibit stronger instructional characteristics. This latter interpretation is supported by the fact that comparisons of the two groups during the first 3 weeks of the year (Emmer & Evertson, Note 3) did not show the marked differences between the two groups' instructional characteristics, although they were differentiated on the managerial variables early in the year. This suggests that, over time, poor management practices interfere with instructional activities. A third reason for the differences on the instructional characteristics is halo effect on the ratings. Observers who formed a favorable or unfavorable impression of a teacher might very well do so on the basis of the level of management skills and on the degree of disruptive or inappropriate behavior exhibited by students. Therefore, some of the better managers' higher ratings on instructional characteristics (or other variables) might be the result of a general positive set toward them by the observers. We do not think that halo accounts for all the differences, because the two groups of teachers were not rated as different on a number of the variables.

The preceding discussion outlines major differences between the more effective and less effective teachers. In order to fill in this outline with detail, and thereby convey a better image of how the management practices of the two groups differed, the next section of this report will present descriptive summaries of several narratives from two teachers. Because management processes throughout the year are influenced by the beginning of the year, more emphasis was given to

early narrative data in preparing the case studies.

ILLUSTRATIVE MATERIAL: CASE STUDIES OF TWO TEACHERS

The following material is excerpted from the narrative scripts of Teacher Y, a poor manager, and Teacher A, a highly capable manager. Both taught seventh-grade classes whose entering achievement means were at grade level.

Case Study 1: Teacher Y

August 28 (First day of school)

Time	Description of Activity
6 min.	As students enter the room, Teacher Y tells them to solve a problem which is written on the chalkboard. He calls roll, telling students to raise their hands when their names are called; the handraising procedure is consistently enforced.
5 min.	Checking of chalkboard problem. The teacher has students pass in their work: Several students appear surprised at this.
15 min.	Presentation and explanation of rules and procedures in the following order. 1) No running in the hallway. 2) Fire drill procedures. 3) Tardiness. (Students must be seated and working on their warm-up problems.) 4) End of period procedures. 5) No grooming in the classroom. 6) Students must stay in their seats during class. 7) Hall passes only for emergencies. 8) No tobacco chewing. 9) Respect each others' property. 10) No hats. 11) Raise hands. No calling out. Several of the rules are elaborated. "Respect for property means not sitting on others' desks." Except for a few answers to questions, students are quiet. One student asks about gum: Teacher Y gives a qualified "yes." No inappropriate behavior is noted during this period. An assessment of student engagement indicates that all students are on task. The teacher either stands at the front of the class, or moves around maintaining good visibility.
2 min.	Transition to seatwork. Teacher Y announces a test "to find out where you are at." Students are to solve 10 problems on the chalkboard.
11 min.	Students work on the problems. Teacher Y fills in a seating chart, apparently intending to allow the students to remain in their present seats. When several students complete the problems within 6 minutes, the teacher copies additional problems on the board. After 11 minutes, Teacher Y calls for students to turn in their papers. Several students whisper to each other during the seatwork activity, eliciting no reaction from the teacher until the end of the activity, when he moves closer to them.
7 min.	Teacher Y presents grading procedures to the whole class: 50% for homework and warm-up, 50% for tests and pop quizzes. PA announcements interrupt the period for 3 minutes, and the teacher copies on the chalkboard the main points of the message.

The end of period bell rings. Several students rise and the teacher motions them back. He checks the room for cleanliness and then dismisses the class.

August 29 (Second class day)

Time	Description of Activity
7 min.	Beginning of period. Some students work on their warm-up problem, while PA announcements are read. Teacher Y takes roll, and then lists three activities for the period: warm-up problems, diagnostic test, obtain locks for lockers.
4 min.	Teacher Y tells students, "You are going to have to work quietly on your own today. If you can't do this, then we will have to do the problems after school." He asks students about the warm-up problem, and allows students to call out without raising their hands. Then Teacher Y reviews the fire drill rule, recalling a personal, humorous anecdote, which students seem to enjoy.
17 min.	Teacher Y calls for the students, row by row, to get their locks. Other students work on the diagnostic test. A student calls out from a seat at the back of the room, "Do you have change?" The teacher responds, "Yes." As the teacher checks out locks, he does not monitor, and thus fails to see several students talking. At one point, seven students are off task. Other students begin to work together on problems. Several students are observed out of seat. Some loud talk is noted, and 15 minutes after [illegible] activity has begun, the teacher goes to a boy who is talking and has him move his seat. The teacher then contacts several students individually and asks them to be quiet.
7 min.	Teacher Y interrupts the diagnostic test to demonstrate how to open the combination locks.
13 min.	Teacher Y fills out a form at his desk. Students return to the diagnostic test. Some talking occurs. After a few minutes, the teacher begins to move about the room, monitoring and asking students to be quiet. Some talking continues.
22 min.	Students check their own diagnostic tests. The teacher has various students give their answers, as the rest of the class checks their papers. Some calling out, without permission, occurs. The teacher accepts the callouts. Then after several more, he says, "Remember yesterday? Don't call out." Callouts decrease. The teacher sends several students to work problems at the board. Students at their seats have nothing to do; several talk to each other.
	The end-of-period bell rings. Teacher Y dismisses the students who leave in an orderly manner.

August 31 (Fourth class day)

Time	Description of Activity
5 min.	Beginning of period. PA announcements. Teacher Y copies the main points on the board. A warm-up problem is on the board for students.
5 min.	Teacher Y asks, "Are there questions?" A student asks, "What if you have detention?" A discussion of detention procedures ensues. Then the teacher corrects the warm-up problem.
24 min.	Checking. The teacher excuses a student to go to his locker to get his book. The teacher calls on students to supply the answer to each problem. When students have questions, they call out without raising their hands. Several students in the group at the back of the room are noted as frequently off task. The teacher ignores them. The teacher frequently asks students to explain their answers. Several interruptions occur: A student changes seats and moves back after some discussion with the teacher; the teacher digresses in an attempt to get students to spell "equivalent." The teacher finally has students hand papers in.
3 min.	Teacher Y signals for attention by saying, "Watch, please. Quickly." Students attend. Some question and answer sequences occur. Several students are off task and the teacher ignores them. A student comments, "The clock ticks on."
28 min.	Seatwork. The teacher tells the class to open their books and go on with their homework. A student calls out, complaining about another student, but the teacher ignores him. The teacher goes to another student to get him started on his work. The teacher moves about the room for a minute, assisting students. Four girls are off task. After a few minutes several others are not working. The teacher is at the front of the room when he snaps his fingers at the students saying, "Do your work." After about 10 minutes, most of the class is talking. The teacher is working with a student at the front of the room. He stops, snaps his fingers and says, "Shhh." The noise increases. A few minutes later the teacher tells the class to put their books up. A few minutes later the bell rings.

September 27 (approximately 1 month into the school year)

Time	Description of Activity
13 min.	When the period begins Teacher Y asks the students to get their homework for checking. Then Teacher Y calls on several students to provide the correct answers. Frequent inappropriate comments are made by students, often interrupting the

checking. The teacher does not respond to the callouts and only calls on students with raised hands.

5 min. Board work. Teacher Y sends five students to the chalkboard. Four other students are out of seat. Some scuffling and noise occurs. The teacher tries to read a problem, but is interrupted six times before he completes it. Students at their seats are expected to work the problem on scratch paper, but the teacher tells them that they will not need to turn it in. Considerable talking and fooling around occur and two students receive a 30 minute detention from the teacher for talking.

25 min. Seatwork. The teacher assigns 57 addition problems for homework and tells students to raise their hands, "If you want anything." Two students receive 30 minutes detention for noise. The class settles down somewhat, but several students continue to be off task and converse loudly. Eight minutes have elapsed and several students close their books. The teacher passes out extra credit worksheets. Students are eager to obtain them. The teacher takes two students who are talking out to the hall for a conference. Numerous students are noted as off task. After the teacher returns to the room with the students he threatens another student with an additional 30 minutes of detention, telling her that the whole class is disrupted while he's trying to talk to her. Throughout the seatwork activity, the teacher's focus is primarily on dealing with noisy or other inappropriate behavior or responding to students' procedural requests.

The end of period bell rings. The teacher tells students to stay in their seats, reminding them to behave better tomorrow. Then he dismisses them.

Discussion of Teacher Y

Teacher Y was in several respects a prototype for the teachers who encountered management problems. Their difficulties with management were not so overwhelming as to prevent them from teaching nor were their skills entirely deficient. The overall engagement rate was around 70% in his class, so the teacher was able to sustain class activities for a majority of students. In addition, Teacher Y was able to explain concepts and problems reasonably well, and he worked hard to develop the students' ability to analyze and solve problems. However, Teacher Y encountered serious problems in managing behavior. High levels of inappropriate behavior were common throughout the year, and at any given

time during class many students would be observed as off task. Although Teacher Y's class did not disintegrate into total chaos, neither did it produce the kind of environment for learning which it might have.

In several respects, Teacher Y made a good start on the first day of school. He opened the period with an activity designed to keep students engaged while he handled the administrative routines of the first day. Although some of his rules were unnecessary, they did no harm and the procedures were adequate for the first day's activities. For the most part, the teacher's actions were consistent with the stated expectations.

Teacher Y generated some of his problems by not developing acceptable procedures for certain activities, mainly seatwork and checking. These difficulties began to be apparent during the second day of classes. For example, students were not told what behavior was expected of them during seatwork other than, "Work quietly on your own." No indication was given whether "quietly" meant no talk, quiet whispering, or classroom voices. Also, no instructions were provided for students when they completed their work, had difficulty with an assignment, wanted to ask a question or check their progress. Later, the checking procedures caused problems because procedures were not established when students needed clarification or explanation (e.g., hold your questions until all answers are given). Consequently, students frequently interrupted with callouts. The teacher contributed dramatically to the problems with the checking activity by his own frequent interruption of this activity's flow, to probe or to explain an answer. He thus served as a model for the very behaviors which slowed down momentum.

The teacher's monitoring behavior, especially during seatwork activities, contributed to the establishment of the relatively high level of inappropriate behavior. By not monitoring closely during the second day's seatwork activity, the teacher allowed several students to remain off-task for long periods and to involve other students as well. The teacher's monitoring task was made more difficult by the absence of a procedure for commencing an activity (for example, requiring each student to have paper and text ready, or working the first few assigned problems as a whole class activity). Nor did the teacher consistently watch the whole class for a few minutes at the beginning of seatwork. Instead, he would frequently work with an individual student or react to noisy behavior.

The inconsistent use of the hand raising rule and the frequent acceptance of callouts resulted in management problems in whole class as well as in seatwork activities. During content development activities, frequent call outs introduced discontinuity to the lessons. They may also serve as a cue for other students' callouts. During seatwork, they can divert other students' attention, causing what Kounin and Gump (1975) have described as an interrupted signal flow. It may be possible to develop procedures to insulate students from these interruptions (for example, teach students to "tune out"), but, of course, this teacher did not do so.

It is also noteworthy that this teacher rarely dealt with widespread inappropriate behavior by addressing the whole class. Instead, he usually initiated individual contacts. Perhaps he wanted to avoid the possibility of total non-cooperation, and he did not feel sufficiently secure to risk a confrontation. The pattern of behavior indi-

cated in the last lesson (September 27) persisted throughout the year. The teacher tried various remedies such as introducing a behavior modification procedure later in the year, but nothing he did improved the situation.

Case Study 2: Teacher A

August 28 (First day of school)

Time	Description / Activity
4 min.	Teacher A begins the class when the bell rings by introducing herself and providing information about her background, schooling, and family. She calls roll, asking students to give their first names.
13 min.	Teacher A passes out three-by-five cards and asks students to list several items of information on them. The teacher stands at the front of the room monitoring students while they complete the task. A few students quietly ask procedural questions both with and without raising their hands. The teacher responds to both types. Teacher A then distributes a list of materials needed for class. A pupil seated near the teacher asks three or four questions; the teacher answers and moves away from him.
32 min.	The teacher tells students that they will have to be really good listeners today. She then describes rules and procedures. She shows an example of a former student's notebook and uses it to describe what work will be expected from the students. She indicates that talking during seatwork is not acceptable even if students finish their assigned work. She shows the class where an extra credit puzzle problem can be found everyday, if they finish their other work. The teacher gives each student a ditto sheet listing rules and some procedures for the class. 1) Be in class when the tardy bell begins to ring. 2) Be attentive during announcements. 3) Present your absence permits as you enter the room. 4) Don't talk unnecessarily. 5) Students are to bring their material everyday. 6) Conduct yourselves in an orderly and appropriate manner. 7) Be sensitive to others' feelings. 8) Be respectful to teachers and classmates. 9) Everyone will remain in the room at all times unless an emergency arises. 10) Have your pencil ready before class begins. The teacher reads the list and explains or justifies several items. A student asks about gum and the teacher gives a qualified acceptance, describing appropriate gum chewing behavior. The teacher then picks up the three-by-five cards.
5 min.	The teacher assigns the problem at the blackboard for extra credit telling the students that they can put it in their notebook. Students get out paper to work on the problem. Several hands go up to confirm correct answers or to ask questions during the 5 minute time. No off-task or inappropriate behaviors occur. By the end of the period seven students have correctly solved the problem.

The end-of-period bell rings. The teacher dismisses the students. The observer noted at the end of the narrative that the teacher's manner during the lesson was pleasant and cordial, that she smiled frequently, but that she was also serious and businesslike.

August 29 (Second day of school)

Time	Description of Activity
2 min.	Before the beginning of the period the teacher reseats students alphabetically. When the bell rings, the seating arrangement is complete. Written on the front board are the reminders: Be on time; sharpen pencils before class; bring materials; wait to be dismissed.
17 min.	The teacher begins class by asking whether anyone has begun their notebooks. Several have and during the next 5 minutes the teacher elaborates on the topic. Then, for the first time today, a boy calls out without raising his hand. The teacher says to him quietly, "Raise your hand," and she walks away from the student. The student says nothing further. The teacher distributes a ditto sheet to each student. The sheet has sections for recording homework grades, test grades, and a notebook score, for each grading period. The teacher describes in some detail how to use the sheet, telling students that it will be a part of their notebooks. During this activity the teacher calls only on students who raise their hands. Callouts are not responded to and rarely occur.
13 min.	The teacher states that she will now check out textbooks, and she hands out an extra credit worksheet for students to do while they wait. She discusses procedures for completing the sheet, and a legible copy of the sheet is posted for students who cannot read a part of their own copy. The teacher refuses a student's request to go to the pencil sharpener while she is talking. The teacher calls students to her desk one at a time to check out the textbooks. The desk is at the back of the room so the students are seated with their backs to the teacher. However, the teacher can easily see the students. During this activity the students are on task completing the worksheet which is an easy, self-checking one, requiring the identification of odd and even sums. The only interruptions of the teacher occur when a few students find illegible numbers; the teacher then directs them to the posted copy. No loud talk occurs among the students and only a little whispering.
15 min.	When all the students have received a text, the teacher returns to the front of the room and gives instructions regarding what to do when the students complete the worksheet. The teacher remains at the front or moves around the room, monitoring and

answering questions. Students stay on task throughout the period.
When the bell rings the teacher asks students to get their things together. She then dismisses them.

August 31 (Fourth day of school)

Time	Description of Activity
4 min.	All students are seated before the bell rings. The teacher checks roll. When the bell rings the teacher has students open their notebooks while she distributes materials. A boy heads for the pencil sharpener, but the teacher calls him back saying, "This is not the time to sharpen your pencil." As the teacher passes out the materials, she calls softly to a girl who is talking and asks her if she has something to say. The girl says, "No," and the teacher says, "Then turn around and don't talk."
11 min.	The teacher begins a lesson on properties of sets. She uses a pattern of asking a question, calling on a volunteer to answer, and giving feedback or elaborating the answer. Typically four or five examples of each concept are presented by the teacher or elicited from students. Many students, raising their hands, volunteer the answers.
5 min.	Teacher A gives directions on how to set up papers for doing an assignment. The homework assignment is to be worked on after the students complete the diagnostic test. Procedures for the remainder of the period are reviewed including a new extra point puzzle.
35 min.	Students begin working on the diagnostic test. Once students have begun, the teacher goes to her desk, monitoring students while she works. Several students complete the test in the next 15 minutes and bring it back to her. A few minutes later Teacher A leaves her desk and checks each student's progress. After students complete the test, they begin working on the assignment. No talking occurs, except once, when a boy leaves his seat for a few seconds to assist another student with a homework assignment. Teacher A observes this and walks by the students without saying anything. The student returns to his seat shortly thereafter. Throughout the seatwork most students are on task continuously. Students raise their hands when they need assistance and the teacher goes to them. If the teacher is busy, the students wait. When the bell rings, the teacher is at the back of the room. Students turn their heads to check with her, and she dismisses them.

October 5

Time	Description of Activity
3 min.	The period begins with a "warm-up" activity, in this case a seatwork review of multiplication in which the teacher quickly calls out 10 numbers and the students use the numbers successively with a constant to form products. All students complete the task and they hand in their papers.
7 min.	Checking. Students correct their own papers today. Teacher A calls out answers taking repeats after the answer. All students correctly follow the checking procedures.
4 min.	The teacher calls roll and takes grades at the same time. The students are told to file their papers in their notebooks. Three of the 28 students in the class have not completed the assignment and receive zeros.
45 min.	Content development. The teacher writes the title "Division" on the blackboard and begins a lesson on long division, noting that she knows they can do simple division problems but she wants to be sure they all know how to do long division. Initial components of the lesson include: 1) Naming the parts of the division problem. 2) Specifiying the digits needed in the quotient. 3) Identifying when a remainder is needed and what it means. The teacher calls on both volunteers and non-volunteers as she works step-by-step through several problems. Then she has students work a problem and she guides them recitation-style through the sequence. At the end, she checks with several students who earlier had said they had trouble with division. Twelve minutes have elapsed so far during this activity. No students are observed off task. The teacher lists the steps for division, and students copy them in their notebooks. The teacher then has all students do several problems. For the remainder of the period, the teacher has individual students go to the board to work problems, while at their seats the students also solve them. The teacher then uses the boardwork for analysis. During SER assessments in this activity, no off-task behaviors were noted. Only two instances of inappropriate behavior were noted at other times. Once a boy rested his head on his desk for a while. The teacher asked a nearby girl if he was awake. The boy raised up and said that he was. On one other occasion, a girl left her seat and went to the teacher to ask permission to put the next problem on the board; the teacher told her to sit down.
30 sec.	Shortly before the bell the teacher tells the students to get their materials together and whisper quietly if they talk. The bell rings and the students leave.

Discussion of Teacher A

The October 5 observation of Teacher A's class was typical of her classes throughout the remainder of the year. High levels of on-task behavior almost always occurred; sustained inappropriate behavior was rare. Occasionally, observers would report visual wandering, whispering, fidgeting, or passive avoidance of seatwork but always against a background of high levels of task engagement. Disruptive behavior was never observed.

It might be thought that Teacher A was simply fortunate to have received an especially motivated, well behaved group of students. However, we observed the same management results in the teacher's other observed class. Furthermore, classes taught by other teachers in the same school exhibited a range of management results, suggesting a potential for behavior problems that existed but did not materialize in Teacher A's class.

After the beginning of the year, it was characteristic of Teacher A to use relatively large amounts of class time for content development, as opposed to procedural activities or seatwork. During the content development activity, the teacher kept the students in the whole class format and required their participation through frequent question and answer sequences, boardwork, and in-class problems. The variety of content development activities undoubtedly helped sustain attention, along with the procedure of having students work problems at their seats or take notes as discussion and analysis proceeded.

Throughout the year the teacher continued to be a careful monitor of student behavior and rarely allowed sustained off-task behavior. Her monitoring task was simplified by the low rate of inappropriate behavior

which caused such behavior to stand out when it occurred. Teacher A's mode of dealing with inappropriate behavior was occasionally to ignore it, but to usually deal with it directly. Sometimes the student would be reminded of the rule or procedure to be followed, occasionally a penalty or criticism might be meted out, and most commonly the student would simply be asked to stop or told what behavior he was expected to perform. The apparent norm for appropriate behavior in the class, coupled with the teacher's generally friendly yet businesslike manner must have made it difficult for a student to seriously consider resistance.

At the beginning of the year, Teacher A's rules and procedures established a clear set of expectations for behavior. Some of the written rules (for example, don't talk unnecessarily) lacked specificity, but were clarified subsequently in the discussion of the rules and by the procedures which were taught to the students. The teacher's early and consistent enforcement of the system of rules and procedures helped the teacher to obtain high task engagement early in the year. In addition, early class activities were either led by the teacher or designed to keep students involved successfully in seatwork, with few distractions. Thus the teacher insulated students from possible disruptions and established appropriate behavior at a high level from the very beginning of the year.

Teacher A liked a quiet, orderly classroom, although she did not insist on total silence. Sometimes she allowed students to assist others during seatwork and occasionally at the end of class she played a math game with the students or permitted social talk. She elicited a high rate of participation during content development activities through

frequent questioning and boardwork. Her emphasis on order and control was typical of the better managers observed in this study, although Teacher A probably placed higher emphasis on achieving task engagement than even the average good manager in this study. While this emphasis might suggest to some the rigid, authoritarian style against which students would react negatively, in fact, observers reported that the classroom climate seemed positive and not repressive. Pupils were not withdrawn, and they participated at high rates, but within established procedures. That the teacher's procedures achieved desirable results cannot be disputed: The class mean residual achievement scores were the highest in the study, and her SRT means were among the highest, indicating very positive student attitudes toward her and her instruction.

MANAGEMENT AND ACHIEVEMENT

Although the principal focus of this study is identifying characteristics of effective management, the question of the relationship between management effectiveness and student achievement is of obvious importance. Results presented earlier in this paper indicated that management criteria, such as the proportion of students who are off task and the level of inappropriate behavior averaged across observations, are significantly and negatively correlated with class mean residual achievement. However, the magnitude of these correlations is at best moderate. These correlations suggest that although effective management may create conditions conducive to achievement, it is no guarantee of it. Therefore, in order to determine whether other variables in our data set might add to the prediction of achievement, two other analyses were carried out. First, the Component Rating scales were correlated

with class mean residual achievement and student attitudes. Second, time use patterns of subgroups of more and less effective managers were examined.

The correlations between the Component Ratings and the product criteria are listed in Table 8. The correlations between the Component Rating variables and the Student Ratings of Teacher are generally not significant. Many of the variables are correlated with achievement at better than a chance level; however, the magnitude of the correlations is not high. The variables that best predict achievement are those that indicate an ability on the teacher's part to design instruction to accomodate the range of student aptitude or achievement in the class. Because very little individualization or grouping within classes was practiced by the teachers in this study, it would appear that the teacher who is able to adapt instruction for the variation in the class does so by presenting and discussing more systematically and thoroughly the course content.

The manner in which teachers used instructional time was analyzed by looking at subgroups in the sample. Within the group of more effective managers, subgroups of teachers were formed. The first group contains two teachers whose class mean residual achievement scores were well above average. The student ratings of these teachers were also well above average. The second subgroup contains five teachers whose residual achievement means were in the average range. The Student Ratings of Teachers of these teachers ranged from average to high. A third "group," consisting of one teacher, is also shown. This teacher's class means on management criteria had been similar to the group of more

effective managers, but the achievement and attitude scores in both of her classes were well below average.

A comparison of these teachers' time use rates from October through April is given in Table 9. The data are based upon time logs and narratives from both observed classes of each teacher. The time use category names are, for the most part, self-explanatory. An exception may be the category, Content Development, which includes time in which academic content is being presented, discussed, or explained, and more than a few students are receiving instruction. Thus, the category includes lectures, discussions, recitations, demonstrations, or any combination of these activities. Major differences among the groups in time use occurred in content development and seatwork. Higher achievement was associated with more time spent in content development. Lower achievement occurred when the balance of time use shifted away from content development and toward greater amounts of seatwork. In spite of the small n, these differences are statistically significant ($p < .05$) using analysis of variance. Within the group of less effective managers, an analysis of time use did not show differences between subgroups. When three teachers with low achievement residuals were compared to four with residual achievement in the average range, no time use differences were noted.

An illustration of a class with a high seatwork to content development ratio is given below. The teacher is the one whose time use data are presented in the last column in Table 9. This teacher's classes had low residual achievement and low attitudes. It is a seventh-grade class whose mean entering achievement was at grade level.

February 6: Narrative Summary for Teacher C

Time	Description of Activity
8 min.	The teacher checks roll as the students solve warm-up problems. After completing roll check, the teacher circulates around the class, monitoring the students. Students are on task.
5 min.	After handing in the warm-ups, students get out their homework. During checking, the teacher reads the answers as students correct their own papers. Four students are noted as not having done the assignment. After checking, the teacher collects the papers.
3 min.	The teacher now has students copy onto a piece of scratch paper several problems from the board. These are proportion problems of the form: $\frac{6}{7} = \frac{24}{n}$
6 min.	Content development. Teacher C calls for the students' attention and then explains how to find missing terms, using the concept of equivalent fractions. The process is explained twice, with one example. One student's question about the content is answered. The teacher does not ask any questions. One student is noted as obviously inattentive. Teacher C then assigns two problems for seatwork.
8 min.	During seatwork, the teacher circulates as the students complete the problems. She passes back papers during this time and also assists a student who is having difficulty.
3 min.	Content development. Teacher C demonstrates at the board how to find the missing terms in the two previously assigned seatwork problems.
35 min.	Seatwork. The teacher assigns a set of problems which are listed on a side chalkboard. Students must copy them onto their own paper and then solve them. There are 12 proportion problems and three word, or story, problems involving proportions. No disruptive behavior occurs during the seatwork, and most students are on task most of the time. Generally, the teacher circulates through the class assisting students who raise their hands. On a few occasions inappropriate behavior, such as whispering or making faces, occurs. One boy throws a paper wad. Another boy has his head on his desk for a long period of time. However, most students are on task most of the time. The teacher does not see some of the inappropriate behavior; however, when she does see it, she tells the students to desist and they comply. At one point the observer notes that the teacher has not smiled during the period. As the period nears the end, several students have completed the assignment. When the bell rings, some students get up, but the teacher calls them back, and then dismisses the class.

From the perspective of low rates of inappropriate and disruptive behavior and high on-task behavior, this lesson produced satisfactory results. Most of the inappropriate behavior that did occur was surreptitious and did not interfere with other students or the teacher. The teacher had efficient classroom procedures for major activities, such as beginning the period and checking, and students had apparently learned and were practicing the classroom routines. This teacher had established a system of rules and procedures early in the year, and she consistently followed these so that few problems occurred with callouts, excessive noise, widespread task avoidance, or out-of-seat behavior. She monitored student behavior adequately and quickly dealt with inappropriate behavior when she observed it.

Teacher C allocated a substantial portion of the time during the class to instructional use. That is, compared to time spent on administrative tasks, transitions, and dead time, allocated time for mathematics was high. However, of the total time allocated to content during the period, only 9 minutes was allotted to interactive whole class instruction, and this amount was actually higher than the teacher's average. Furthermore, during the 9 minutes of content development, little effort was made by the teacher to assess student understanding by seeking student input or questioning students, nor did the teacher attempt to provide a range of examples illustrating the variety of problems and difficulty levels that students might encounter. In addition, the teacher made no attempt to assist the students in applying the computational procedure to the word problems, which were subsequently assigned as part of seatwork. It would have been reasonable for the teacher to use 10 or 15 minutes of seatwork time for for additional con-

tent development. Rather than having students copy assigned problems from the board, she could have used similar problems available in the course text.

Why the teacher chose this lesson pattern may be inferred from comments she made to observers during the year and from an end-of-year interview. Teacher C expressed considerable concern about discipline and spoke of the potential for problems in her classes. She also indicated that she did not want to keep students in one activity for very long, "Generally, I want activities to run no longer than about 15 minutes, some are 10, some 5. . . ." Except for her extremely long seatwork activities, she consistently followed her stated practice. Thus, the teacher's expectation of discipline problems probably influenced her instructional decisions and may have also interfered with teaching behavior during content development by decreasing the opportunity for student participation and input.

SUMMARY

Our study suggests that effective classroom management throughout the year is facilitated by several facets. The teacher needs a clear set of expectations for appropriate student behavior in a wide variety of classroom activities, such as whole class instruction and seatwork. The expectations must cover several features of student behavior, including contacts with the teacher and other students, procedures for enhancing task engagement and completion, and appropriate use of materials and of the room. These expectations should be translated into a system of rules and procedures which are taught to students early in the year. The system is maintained throughout the year by careful monitoring, prompt handling of deviations, and consistent use of reason-

able consequences when deviations occur. In well managed classes, the level of on-task, appropriate behavior is established at very high levels, and little or no disruption occurs. Deviant behavior is easily observed and runs counter to the classroom behavior norm, hence receives little peer support.

The salutary effects of good management upon student achievement are not inevitable, although on the average the data lead to a prediction of better achievement when better management is in place. The results for time use are not interpreted as indicating that it is simply the time allocated to certain activities that causes achievement. Undoubtedly, the time must be used wisely. It is possible to fill time with discontinuous, incoherent presentations that teach little. A reasonable interpretation of these results is that both content development time and good management are important enabling conditions for instruction. These characteristics of classroom life can be planned and controlled by the teacher, and they provide an opportunity for instructional skills to have maximum impact on learning.

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Table 1

Between-observer Agreement of Component Ratings

for Single Observations

Variable Number	Component Rating Variable	ρ	$p \leq$
01	Teacher describes objectives clearly	.54	.003
02	Teacher considers attention spans	.73	.001
03	Teacher provides assignments for different students	.68	.001
04	Occurrence of verbal class participation	.55	.003
05	Teacher uses a variety of materials	.44	.012
06	Materials are ready and in sufficient quantity	.35	.041
07	Materials effectively support instruction	.46	.010
08	Teacher gives clear directions for use of materials	.64	.001
09	Teacher has distracting mannerisms	.65	.001
10	Teacher maintains eye contact with students	.61	.001
11	Teacher's presentation of materials is clear	.41	.039
12	Teacher's presentation is adapted to different ability levels	.56	.004
13	Teacher provides and/or seeks rationale and analysis	.59	.003
14	Teacher states desired attitudes	.10	.308
15	High degree of pupil success	.46	.009
16	Content is related to pupil interest and background	.67	.001

Table 1, Continued

Variable Number	Component Rating Variable	ρ	p ≤
17	Teacher provides reasonable work standards	.26	.104
18	Amount of positive reinforcement	.38	.029
19	Teacher signals appropriate behavior	.48	.007
20	Teacher reinforces inattentive behavior	.26	.101
21	Teacher displays consistency in dealing with behavior	.39	.024
22	Amount of disruptive behavior	.22	.141
23	Source of disruptive behavior	0	-
24	Teacher stops disruptive behavior quickly	0	-
25	Teacher gives rules or procedures to stop disruptive behavior	0	-
26	Teacher criticizes or justifies authority to stop disruptive behavior	0	-
27	Teacher punishes to stop disruptive behavior	0	-
28	Teacher ignores disruptive behavior	0	-
29	Teacher has a conference to stop disruptive behavior	0	-
30	Teacher displays listening skills	.31	.081
31	Teacher expresses feelings	.30	.069
32	Teacher is receptive to student input	.41	.019
33	Teacher is oriented to student needs	.23	.129
34	Teacher nurtures student affective skills	.56	.002

Table 1, Continued

Variable Number	Component Rating Variable	ρ	$p \leq$
35	Class has task-oriented focus	.65	.001
36	Teacher encourages group cohesiveness	.74	.001
37	Amount of inappropriate behavior	.71	.001
38	Teacher stops inappropriate behavior quickly	.29	.092
39	Teacher gives rules or procedures to stop inappropriate behavior	0	-
40	Teacher criticizes or justifies authority to stop inappropriate behavior	.28	.089
41	Teacher punishes to stop inappropriate behavior	.57	.002
42	Teacher ignores inappropriate behavior	.55	.003
43	Teacher has conference to stop inappropriate behavior	.29	.073
44	Teacher signals desistance of inappropriate behavior	.05	.408

Note: Data are from observer pairs in 24 observations. The intraclass correlation estimates the proportion of individual observer variance that is reliable. The unreliability of Variables 22 through 29 appears to be attributable to the low variance of those measures during the reliability observations.

Table 2

Between-observer Agreement of Student Engagement Rating Categories for Single Observations

Category	ρ	$p <$
Definitely on-task, academic	.71	.001
Probably on-task, academic	0	-
Definitely on-task, procedural	.67	.001
Probably on-task, procedural	.65	.001
Off-task, sanctioned	.78	.001
Off-task, unsanctioned	.74	.001
Dead time	0	-
On-task, academic	.71	.001
On-task, procedural	.68	.001
On-task, total	.78	.001

Note: Data are from observer pairs in 23 observations. The intraclass correlation coefficient ρ, estimates the proportion of individual observer variance that is reliable. The unreliability of Dead time appears to have been caused by its very low occurrence during the reliability observations.

Table 3

Math Intercorrelation Matrices for Rest of Year

(n = 52)

Variable	Residual	SRT	CAT78	ACH
1. Off-task, Unsanctioned	-.37[a]	-.01	-.23	-.33
2. On-task, Academic	.28	.20	.27	.34
3. On-task	.32	.15	.31	.39
4. Disruptive behavior	-.30	.05	-.21	-.29
5. Inappropriate behavior	-.30	.09	-.17	-.24
6. Residual	--	.24	-.01	.27
7. SRT		--	-.09	-.01
8. CAT78			--	.96
9. ACH				--

[a] $p \leq .05$ is indicated by an underline; $p \leq .01$ is indicated by two underlines.

Table 4

Stability Between Classes, Within Teachers,

for Several Management and Product Variable Means

(n = 26 teachers, 2 classes each)

Variable	ρ_1	ρ_2	$p <$
Disruptive behavior	.59	.74	.001
Inappropriate behavior	.85	.92	.001
Off-task, unsanctioned	.63	.77	.001
Dead time	.43	.60	.05
On-task, academic activities	.47	.64	.01
On-task, all activities	.42	.59	.05
Student Ratings of Teachers (SRT)	.62	.76	.001
Residual achievement	.49	.66	.01
Entering achievement (CAT)	.09	.17	.32

Note: The intraclass reliability coefficient (ρ) estimates the proportion of variance attributable to teachers (i.e., to "between" teacher differences). ρ_1 is the reliability of a single class mean; ρ_2 is the reliability of the average of both classes.

Table 5

Means and Standard Deviations

More Effective (n = 7) and Less Effective (n = 7) Managers

on Several Management and Product Variables

Variable	More Effective $\bar{x}$	More Effective SD	Less Effective $\bar{x}$	Less Effective SD
Off-task, unsanctioned[a]	3.4	1.7	17.7	4.1
On-task, academic[a]	81.0	7.3	59.3	6.5
On-task, all activities[a]	93.0	3.4	74.9	4.4
Inappropriate behavior[b]	2.15	.62	3.96	.28
Disruptive behavior[b]	1.17	.18	2.46	.37
Residual achievement	.18	.37	-.11	.14
Student Ratings (SRT)	64.4	4.34	62.1	3.91

[a]Average percentage coded in the category.

[b]Average of the rating (5-point scale) obtained each period.

Table 6

Comparison of the More and Less Effective Managers

on the Component Ratings, October through April Averages

Variable Number	Component Rating Variables[a]	More Effective $\bar{X}$	More Effective SD	Less Effective $\bar{X}$	Less Effective SD	$p <$
01	Teacher describes objectives clearly	4.0	.42	3.1	.48	.01[b]
02	Teacher considers attention spans in lesson design	3.8	.74	2.2	.52	.001
03	Teacher provides assignments for different students	1.7	.72	1.1	.09	.05
04	Occurrence of verbal class participation	3.3	.53	3.0	.46	.21
05	Teacher uses a variety of materials	1.6	.53	1.2	.31	.14
06	Materials are ready and in sufficient quantity	4.7	.31	4.0	.35	.001
07	Materials effectively support instruction	4.5	.38	3.6	.67	.01
08	Teacher gives clear directions for use of materials	4.4	.39	3.1	.65	.001
09	Teacher has distracting mannerisms	1.0	.02	1.7	.39	.01
10	Teacher maintains eye contact with students	4.2	.50	2.7	.50	.001
11	Teacher's presentation is clear	4.4	.51	3.1	.61	.001
12	Teacher's presentation is adapted to different ability levels	3.5	.87	2.4	.64	.05
13	Teacher provides and/or seeks rationale and analysis	3.9	.57	2.8	.90	.05
14	Teacher states desired attitudes	2.6	.46	1.8	.38	.01
15	High degree of pupil success	3.8	.43	2.8	.43	.001

Table 6, Continued

Variable Number	Component Rating Variables[a]	More Effective $\bar{x}$	More Effective SD	Less Effective $\bar{x}$	Less Effective SD	$p <$
16	Content is related to pupil interest and background	2.6	.71	2.5	.69	.74
17	Teacher provides reasonable work standards	4.1	.54	2.5	.65	.001
18	Amount of positive reinforcement	3.2	.51	2.0	.54	.001
19	Teacher signals appropriate behavior	3.3	.65	2.2	.62	.01
20	Teacher reinforces inattentive behavior	1.8	.46	2.5	.25	.01
21	Teacher displays consistency in dealing with behavior	3.8	.64	2.3	.57	.001
22	Amount of disruptive behavior[c]	1.2	.18	2.5	.37	.001
23	Source of disruptive behavior[c]	1.8	.40	2.9	.34	.01
24	Teacher stops disruptive behavior quickly	3.5	.63	1.9	.50	.01
25	Teacher gives rules or procedures to stop disruptive behavior[c]	1.4	.38	1.6	.26	.56
26	Teacher criticizes or justifies authority to stop disruptive behavior[c]	2.0	.55	1.9	.67	.87
27	Teacher punishes to stop disruptive behavior[c]	1.8	.32	1.6	.59	.53
28	Teacher ignores disruptive behavior[c]	2.1	.78	2.9	1.04	.20
29	Teacher has a conference to stop disruptive behavior[c]	.1	.08	.6	.41	.05
30	Teacher displays listening skills	3.4	.74	2.3	.78	.01
31	Teacher expresses feelings	2.5	.62	2.0	.78	.19
32	Teacher is receptive to student input	3.6	.59	2.4	.69	.01

Table 6, Continued

Variable Number	Component Rating Variables[a]	More Effective $\bar{X}$	More Effective SD	Less Effective $\bar{X}$	Less Effective SD	$p <$
33	Teacher is oriented to student needs	3.8	.31	2.9	.47	.001
34	Teacher nurtures student affective skills	1.3	.34	1.2	.27	.58
35	Class has task-oriented focus	4.4	.44	2.7	.51	.001
36	Teacher encourages group cohesiveness	2.3	.35	1.9	.91	.26
37	Amount of inappropriate behavior	2.1	.62	4.0	.28	.001
38	Teacher stops inappropriate behavior quickly	3.7	.72	1.7	.24	.001
39	Teacher gives rules or procedures to stop inappropriate behavior	1.7	.50	1.6	.13	.71
40	Teacher criticizes or justifies authority to stop inappropriate behavior	1.6	.35	1.7	.53	.69
41	Teacher punishes to stop inappropriate behavior	1.4	.34	1.5	.63	.68
42	Teacher ignores inappropriate behavior	2.3	.65	3.4	.60	.01
43	Teacher has conference to stop inappropriate behavior (frequency per observation)	.2	.28	.9	.64	.05
44	Teacher signals desistance of inappropriate behavior	3.0	.59	3.2	.71	.46

[a]Variables rated on a 5-point scale; 5 = Highly characteristic, 1 = Not at all characteristic.

[b]The probability reported is for a 2-tailed *t*-test of the difference between means.

[c]No disruptive behavior was observed in three more effective managers' classes, so the mean for the more effective group is based on data from the other four teachers' classes.

Table 7

Time Use Contrasts for More and Less Effective Managers: Average Minutes per Class Period

Time Use Category	More Effective $\bar{x}$	More Effective SD	Less Effective $\bar{x}$	Less Effective SD	$p <$
Content development	15.7	8.5	15.8	6.1	.97[a]
Seatwork	17.7	9.5	20.5	6.3	.53
Administrative routines	3.6	2.8	3.0	2.5	.68
Transitions	3.6	1.8	5.4	2.9	.18
Checking	5.4	2.2	5.3	2.9	.96
Tests	3.6	3.9	1.2	2.2	.17
Dead time	.9	1.1	2.9	2.4	.08
Small groups	4.1	10.8	0	0	.36
Other	.3	.9	.6	.9	.55

[a]Probability reported is for a 2-tailed t test of the difference between means.

Table 8

Correlation of Component Rating Variables

with Mean Student Attitudes (SRT)

and Residual Achievement in 52 Math Classes

Variable Number	Component Rating Variable	SRT	ACH
01	Teacher describes objectives clearly	.23	.22
02	Teacher considers attention spans	.13	.39**
03	Teacher provides assignments for different students	.03	-.03
04	Occurrence of verbal class participation	.15	.16
05	Teacher uses a variety of materials	.17	-.06
06	Materials are ready and in sufficient quantity	-.11	.24*
07	Materials effectively support instruction	-.04	.13
08	Teacher gives clear directions for use of materials	.00	.12
09	Teacher has distracting mannerisms	.06	-.17
10	Teacher maintains eye contact with students	-.16	.19
11	Teacher's presentation of materials is clear	.22	.23*
12	Teacher's presentation is adapted to different ability levels	.23*	.33**
13	Teacher provides and/or seeks rationale and analysis	.14	.24*
14	Teacher states desired attitudes/behavior	-.22	.00
15	High degree of pupil success	.05	.32**
16	Content is related to pupil interest and background	.04	-.18

Table 8, Continued

Variable Number	Component Rating Variable	SRT	ACH
17	Teacher provides reasonable work standards	-.07	.24*
18	Amount of positive reinforcement	.06	.27**
19	Teacher signals appropriate behavior	-.17	-.15
20	Teacher reinforces inattentive behavior	.13	-.25*
21	Teacher displays consistency in dealing with behavior	-.03	.20
22	Amount of disruptive behavior	.05	-.30**
23	Source of disruptive behavior	-.06	-.09
24	Teacher stops disruptive behavior quickly	-.16	-.27*
25	Teacher gives rules or procedures to stop disruptive behavior	.07	-.09
26	Teacher criticizes or justifies authority to stop disruptive behavior	-.19	.07
27	Teacher punishes to stop disruptive behavior	-.15	-.10
28	Teacher ignores disruptive behavior	.16	.16
29	Teacher has a conference to stop disruptive behavior	-.03	-.34**
30	Teacher displays listening skills	.20	.25*
31	Teacher expresses feelings	-.14	-.02
32	Teacher is receptive to student input	.21	.37**
33	Teacher is oriented to student needs	.08	.09
34	Teacher nurtures student affective skills	-.07	-.01
35	Class has task-oriented focus	.07	.17
36	Teacher encourages group cohesiveness	.24	.07
37	Amount of inappropriate behavior	.09	-.30**
38	Teacher stops inappropriate behavior quickly	-.14	.24*

Table 8, Continued

Variable Number	Component Rating Variable	SRT	ACH
39	Teacher gives rules or procedures to stop inappropriate behavior	.13	-.22
40	Teacher criticizes or justifies authority to stop inappropriate behavior	-.10	-.06
41	Teacher punishes to stop inappropriate behavior	-.22	-.25*
42	Teacher ignores inappropriate behavior	.05	-.20
43	Teacher has conference to stop inappropriate behavior	-.19	-.38**
44	Teacher signals desistance of inappropriate behavior	-.39**	-.41**

*$p < .10$

**$p < .05$

Table 9

Time Use Contrasts for Subgroups of Effective Managers: Average Minutes per Class Period Group

Time Use Category	High Achievement (n = 2)	Average Achievement (n = 5)	Low Achievement (n = 1)
Content development	25.1	11.9	6.3
Seatwork	10.1	20.8	29.6
Administrative routines	3.1	3.8	1.8
Transitions	3.1	3.8	4.1
Checking	5.4	5.4	3.4
Tests	7.7	2.0	7.6
Dead time	.8	.9	.3
Other	1.1	5.7	0.0
Total	56.5	54.3	53.4

Note: The total time is not exactly equal to the sum of the categories because of rounding error.